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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/625,681	07/24/2003	Takashi Arita	1614.1350	1084
21171	7590	06/13/2006		
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005				
			EXAMINER ONEILL, KARIE AMBER	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b>		<b>Applicant(s)</b>	
	10/625,681		ARITA ET AL.	
	<b>Examiner</b>		<b>Art Unit</b>	
	Karie O'Neill		1746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 25 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>7-24-03</u> .   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3, 9, 11, 15, 17, 19-20 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Akikusa et al. (US 2004/0028994 A1).

Akikusa et al. discloses in Figure 1, a fuel cell comprising a membrane electrode assembly having first and second sides to which a fuel electrode (12) and an air electrode (13) are joined, respectively; a fuel electrode housing (metal separator 17) having an internal face on which a fuel channel (20) and a fuel-side electrode film (fuel electrode current collector 16) are formed; and an air electrode housing (metal separator 17) having an air passage (21) formed therein, the air electrode housing having an internal face on which an air-side electrode film (air electrode current collector 18) is formed, wherein: said fuel electrode housing is joined to said MEA with the internal face thereof facing the fuel electrode of said MEA so that the fuel-side electrode film is electrically connected to the fuel electrode; and said air electrode housing is joined to said MEA with the internal face thereof facing the air electrode of said MEA so

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that the air-side electrode film is electrically connected to the air electrode. It is disclosed wherein the one of the fuel-side electrode film (16) or air-side electrode film (18) projects in a center part thereof, as seen in Figure 1, and a metal mesh body (18b) is formed on at least one of the fuel-side electrode film and the air-side electrode film so as to be in contact with a corresponding one of the fuel electrode and the air electrode; and the one of the fuel-side electrode film and the air-side electrode film is electrically connected to the corresponding one of the fuel electrode and the air electrode by the contact of the metal mesh body with the corresponding one of the fuel electrode and the air electrode (paragraph 0056 and Figure 3). In paragraph 0058, Akikusa et al. discloses a plurality of vent holes (17a) formed in said air electrode housing so as to penetrate through the air-side electrode film and a fuel reservoir is attached to said fuel electrode housing to introduce fuel to the electrode. In paragraph 0051, Akikusa et al. discloses the fuel supply channel having respective openings communicating therewith for receiving fuel wherein the fuel channel is formed on the fuel side electrode film in said fuel electrode housing. It would also be inherent that the fuel cell would be shaped so as to be containable in a vacant space of an apparatus in which the fuel cell is to be mounted.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2, 4-8, 10, 14, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akikusa et al. (US 2004/0028994 A1) in view of Kaneta et al. (US 6,699,593 B2).

Akikusa et al. discloses the fuel cell of Claim 1 above, but does not disclose the fuel cell wherein at least one of the fuel-side electrode film and the air-side electrode film is curved toward a corresponding one the fuel electrode and the air electrode, each of the fuel-side electrode film and the air-side electrode film if formed by plating an electroless nickel plating undercoat with gold, the fuel-side electrode film and the air-side electrode film are formed integrally with said fuel electrode housing and said air electrode housing, the fuel-side electrode film and the air-side electrode film are deposited on said fuel electrode housing and air electrode housing, by plating and by coating. He also does not disclose the metal member comprising a plurality of projections, an edge part of said fuel electrode housing and an edge part of said air electrode housing are sealed by ultrasonic welding, the fuel channel of fuel electrode housing is formed of a plurality of fuel supply channels that are formed by dividing a space that is in contact with the fuel electrode of said MEA, and at least one of the fuel electrode housing, air electrode housing, the fuel-side electrode film and the air-side electrode film is formed to have a shape including a curved surface.

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Kaneta et al. discloses in Figures 1, 4 and 5, a metallic separator for fuel cells made of nickel (column 9 lines 45-46) and plated with a noble-metal such as gold (column 10 lines 1-2) and formed in a corrugated shape with a plurality of projections, wherein at least one of the fuel-side electrode film and the air-side electrode film is curved toward a corresponding one of the fuel electrode and the air electrode and have a shape including a curved surface. In column 10, lines 61-65, Kaneta et al. discloses the method for depositing the electrode films through vapor deposition, sputtering, electroless plating and coating and then subjecting the metal and noble-metal coating to pressing to make the layers integral and to form passages for a fuel gas to pass through (column 5 lines 24-26). Kaneta et al. also discloses in column 15 lines 31-34, the separators are united with each other by fixing the ridges of one separator to the ridges of the other by welding.

Akikusa et al. and Kaneta et al. are analogous art because they are from the same field of endeavor, fuel cells. That time of the invention it would have been obvious to one of ordinary skill in the art to add the features of the Kaneta et al. reference to the fuel cell of Akikusa et al., the motivation being to make the separator highly corrosion resistant by plating nickel with gold, to densify the separator by pressing the layers and making them integral with one another (column 18 lines 21+) and a low contact electrical resistance (column 14 lines 31-33).

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Akikusa et al. (US 2004/0028994 A1) in view of Wakahoi et al. (US 6,602,632 B2).

Akikusa et al. discloses the fuel cell of Claim 1 above, but does not disclose the fuel cell further comprising a packing provided between an edge part of said fuel electrode housing and an edge part of said air electrode housing, wherein: said fuel electrode housing and said air electrode housing are fastened by a fastening member; and the edge parts of said fuel electrode housing and air electrode housing are sealed.

Wakahoi et al. discloses in column 2 lines 16-25, a sealing member affixed by being pushed into the grooves of the separators and both separators are fitted to both sides of the MEA and are fastened thereagainst by being clamped.

Akikusa et al. and Wakahoi et al. are analogous art because they are from the same field of endeavor, fuel cells. At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the features of the Wakahoi et al. reference with the fuel cell of Akikusa et al. for the purpose of enhancing the sealing performance and reduce the overall force which is required for clamping the separators together (column 3 lines 22-24).

Claims 12, 21-22 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Akikusa et al. (US 2004/0028994 A1) in view of Schnacke (US 4,510,213) and in further view of Kaneta et al. (US 6,699,593 B2).

Akikusa et al. discloses the fuel cell of Claim 1 above, but does not disclose the fuel cell with a metal member comprising a plurality of springs, further comprising a metal wire provided between an edge part of the said fuel electrode housing and an edge part of said air electrode housing so as to be electrically connected to the fuel-side

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electrode film, wherein the edge parts of said fuel electrode housing and said air electrode housing are sealed by welding and the metal wire is employed as an extension electrode. He also does not disclose a plurality of fuel cells as set forth in Claim 1 wherein, each fuel cell has a first extension electrically connected to the fuel-side electrode film of said fuel electrode housing and exposed therefrom through an opening, and a second extension electrode electrically connected to the air-side electrode film of said air electrode housing and exposed therefrom through an opening; and the first extension electrode of a first one of the fuel cells is electrically connected by an engagement member to the second extension electrode of a second one of the fuel cells adjacent to the first one of the fuel cells, the engagement member engaging the openings through which the first and second extension electrodes are exposed, respectively.

Schnacke discloses the separator sheets including dimple-like projections or corrugations or fins or other projections (column 5 lines 12-15). Schnacke discloses a plurality of fuel cells each separated from one another by electrically conductive separator sheets and include projections from their inwardly facing major surfaces for engagement with adjacent cell components (column 4 lines 51-65). Schnacke discloses first and second extension lips bonded to the walls of transition frames, which are at the outer edges of first and second electrodes. The extension lips are formed of a metal material and may be an extension of the electrodes, integral with the anode but attached to the cathode (column 6 lines 7-19).



Kaneta et al. discloses the edge parts of said fuel electrode housing and said air electrode housing are sealed by welding (column 15 lines 31-34).

Akikusa et al., Kaneta et al. and Schnacke are analogous art because they are from the same field of endeavor, fuel cells. At the time of the invention it would have been obvious to one of ordinary skill in the art to combine the feature of the Schnacke reference with the fuel cell of Akikusa et al., for the purpose of providing sealing surfaces and to minimize the adverse effects of compressive creep within the fuel cell stack (column 6 lines 51-53).

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Barr can be reached on (571) 272-1414. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

KAO

  
**PATRICK JOSEPH RYAN**  
**SUPERVISORY PATENT EXAMINER**